

Appl. No. 09/931,576  
Amdt. dated June 17, 2005  
Reply to Office Action of December 17, 2004

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**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings of claims in the application:

**Listing of Claims:**

1. (Currently amended) A computing device executing a graphics rendering software program providing instructions to one or more processors to render graphics on a display, the computing device configured to establish a network connection with at least one other computing device, comprising:

a graphics driver ~~rendering~~ configured to render a plurality of drawing surfaces, including a first drawing surface and a second drawing surface, on the display, and

a memory storing graphic objects having a plurality of attributes, wherein attributes from the plurality of attributes are selected from a group consisting: color, font, wherein each graphic object ~~representing~~ represents a drawing surface of the plurality of drawing surfaces,

wherein the graphics driver is configured to render the first drawing surface on the display at least partially overlapping where a portion of the second drawing surface was rendered on the display, and configured to render a visible portion of the second drawing surface as a set of rectangular clip segments,

wherein, when the first drawing surface is rendered as partially overlapping the second drawing surface, a the visible portion of the second drawing surface is computed rendered as a the set of rectangular clip segments, wherein the set of rectangular clip segments is selected from a group consisting of: one rectangular clip segment, two rectangular clip segments, three rectangular clip segments, four rectangular clip segments,

wherein the plurality of attributes of the graphic objects also includes the set of rectangular clip segments ~~are attributes of a graphic object representing the second drawing surface, and~~

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wherein the graphics driver is further configured to increment a visibility tag corresponding to the second drawing surface ~~when a z-order of the second drawing surface is changed when the portion of the second drawing surface is to be overlapped by a portion of the first drawing surface,~~ and

wherein the graphics driver is configured to compute a new the set of rectangular clip segments if the visibility tag corresponding to the second drawing surface is not the same as dissimilar to a visibility tag corresponding to the first drawing surface.

2-3. Canceled.

4. (Currently amended) The computing device of claim 1, wherein the first drawing surface ~~and the second drawing surface, including includes both the a visible portion and an obscured portion, wherein the visible portion and the obscured portion both comprise rectangular borders.~~

5. (Previously presented) The computing device of claim 1, wherein each rectangular clip segment of the set of rectangular clip segments is iteratively output to the display for displaying the visible portion of the second drawing surface.

6. (Currently amended) A computing device executing a graphics rendering software program providing instructions to one or more processors to render graphics on a display computing device configured to establish a network connection with at least one other computing device, comprising:

a graphics driver for rendering configured to render a plurality of drawing surfaces, including a first drawing surface on a display of the computing device and a second drawing surface, surface on a the display of the embedded computing device, and

a memory storing graphic objects having a plurality of attributes selected from a group consisting of: color, font, clipping region, wherein each of the graphic object representing objects represent a drawing surface of the plurality of drawing surfaces,

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wherein the graphics driver is configured to render the first drawing surface on the display at least partially overlapping a region of the second drawing surface on the display that was rendered on the display,

wherein, when the first drawing surface is rendered on the display as partially overlapping the region of the second drawing surface, a visible portion of the second drawing surface is rendered on the display computed as a set of rectangular clip segments,

wherein a plurality of attributes for a graphic object representing the second drawing surface also includes the a set of rectangular clip segments is stored as a graphics context object corresponding to unobsured segments of the second drawing surface, wherein the set of rectangular clip segments is selected from a group consisting of: one rectangular clip segment, two rectangular clip segments, three rectangular clip segments, four rectangular clip segments.

~~wherein the rectangular clip segments are attributes of a graphic object representing the second drawing surface, and~~

wherein the graphics driver is further configured to increment a visibility tag corresponding to the second drawing surface ~~when a z order of the second drawing surface is changed;~~ when the portion of the second drawing surface is to be overlapped by a portion of the first drawing surface, and

wherein the graphics driver is also configured to compute a new the set of rectangular clip segments if the visibility tag corresponding to the second drawing surface is not the same as dissimilar to a visibility tag corresponding to the first drawing surface.

7-8. Canceled.

9. (Currently amended) The computing device of claim 6, wherein the first drawing surface ~~and the second drawing surface, including both the~~ comprises a visible portion and an obscured portion, wherein both the visible portion and the obscured portion both comprise rectangular borders.

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10. (Previously presented) A computing device of claim 18 wherein the clip segments are shaped rectangular.

11-12. Canceled.

13. (Currently amended) The computing device of claim 10, wherein the first drawing surface ~~and the second drawing surface, including both the~~ comprises a visible portion and an obscured portion, wherein both the visible portion and the obscured portion both comprise rectangular borders.

14. Canceled.

15. (Previously presented) The computing device of claim 1, wherein the graphics driver includes:

(1) a shape function layer including a target architecture specific instruction set setting and retrieving pixel numbers, respectively, into and from a one dimensional frame buffer memory; and

(2) a framebuffer access macro layer including a set of macros inlining into the shape function layer.

16. Canceled.

17. (Previously presented) The computing device of claim 6, wherein the graphics driver includes:

(1) a shape function layer including a target architecture specific instruction set for setting and retrieving pixel numbers, respectively, into and from a one dimensional framebuffer memory; and

(2) a framebuffer access macro layer including a set of macros inlining into the shape function layer.

18. (Currently amended) A computing device executing a graphics rendering software program providing instructions to one or more processors to render graphics on a

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display, the computing device configured to establish a network connection with at least one other computing device, comprising:

a graphics driver ~~rendering~~ configured to render a plurality of drawing surfaces, including a first drawing surface and a second drawing surface, on the display, and

a memory ~~storing~~ configured to store graphic objects having a plurality of attributes, ~~wherein attributes from the plurality of attributes are selected from a group consisting:~~ color, font, clip region, wherein each graphic object representing represents a drawing surface of the plurality of drawing surfaces,

wherein the graphics driver is configured to render the first drawing surface at least partially overlapping ~~where a portion of~~ the second drawing surface ~~was rendered~~ on the display, and configured to render a visible portion of the second drawing surface as a set of clip segments, wherein the set of clip segments is selected from a group consisting of: one clip segment, two clip segments, three clip segments, four clip segments,

wherein, when the first drawing surface is rendered as partially overlapping the second drawing surface, a the visible portion of the second drawing surface is ~~computed~~ rendered as a the set of rectangular clip segments,

wherein ~~the a~~ set of clip segments is stored as a ~~graphics context~~ graphic object corresponding to ~~unobscured segments of~~ the second drawing surface,

wherein each clip segment of the set of clip segments is iteratively output to the display for displaying the visible portion of the second drawing surface,

wherein the clip segments are stored as attributes of a the graphic object representing the second drawing surface, and

wherein the graphics driver is further configured to increment a visibility tag corresponding to the second drawing surface ~~when a z-order of the second drawing surface is changed~~ when the portion of the second drawing surface is to be overlapped by a portion of the first drawing surface, and

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wherein the graphics driver is configured to compute a new the set of clip segments if the visibility tag corresponding to the second drawing surface is not the same as dissimilar to a visibility tag corresponding to the first drawing surface.

19. (Previously presented) The computing device of claim 18, wherein the graphics driver includes:

- (1) a shape function layer including a target architecture specific instruction set setting and retrieving pixel numbers, respectively, into and from a one dimensional framebuffer memory; and
- (2) a framebuffer access macro layer including a set of macros inlining into the shape function layer.

20. (Currently amended) A method of rendering graphics including overlapping drawing surfaces on a display of an embedded computing device configured for establishing a network connection with at least one other computing device, comprising the steps of:

(a) storing in memory a ~~partially-obscured~~ drawing surface as a graphic object having a plurality of attributes;

rendering the drawing surface on the display;

determining a obscured portion of the drawing surface on the display to be obscured by a rendering of a portion of another drawing surface;

(a) computing a set of clip segments corresponding to a visible portion of the ~~partially-obscured~~ drawing surface, wherein visible portion of the drawing surface comprises portion of the drawing surface excluding the obscured portion of the drawing surface;

(b) ~~rendering the partially-obscured~~ visible portion of the drawing surface along with ~~an overlapping the portion of the other~~ drawing surface on the display, and

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(e)-incrementing a visibility tag corresponding to the ~~partially obscured~~ drawing surface ~~when a z-order of the second drawing surface is changed~~ when the obscured portion of the second drawing surface is to be overlapped by the portion of the other drawing surface, and

computing ~~a new~~ the set of rectangular clip segments if the visibility tag corresponding to the partially obscured drawing surface is ~~not the same as~~ dissimilar to a visibility tag corresponding to the ~~overlapping other~~ drawing surface,

wherein the set of clip segments are attributes of the graphic object, and

wherein the set of clip segments is selected from a group consisting of: one clip segment, two clip segments, three clip segments, four clip segments.

21. (Currently amended) The method of claim 20, wherein the clip segments correspond to rectangular portions of the visible portion of the ~~partially obscured~~ drawing surface.

22. (Currently amended) The method of claim 21, wherein the ~~partially obscured~~ drawing surface and the ~~overlapping other~~ drawing surface comprise rectangular borders.

23. (Currently amended) The method of claim 21, further comprising the step of storing the set of clip segments as ~~a the~~ the graphics context object corresponding to ~~unobserved segments of the partially obscured drawing surface.~~

24. (Currently amended) The method of claim 23, wherein the clip segments correspond to rectangular portions of the visible portion of the ~~partially obscured~~ drawing surface.

25. (Currently amended) The method of claim 24, wherein the ~~partially obscured~~ drawing surface and the ~~overlapping portion of the other~~ drawing surface comprise rectangular borders.

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26. (Currently amended) The method of claim 23, further comprising the step of iteratively outputting each clip segment of the set of clip segments to the display for displaying the visible portion of the ~~partially-obscured~~ drawing surface.

27. (Currently amended) The method of claim 26, wherein the clip segments correspond to rectangular portions of the visible portion of the ~~partially-obscured~~ drawing surface.

28. (Currently amended) The method of claim 27, wherein the ~~partially obscured~~ drawing surface and the overlapping portion of the other drawing surface comprise rectangular borders.

29. (Currently amended) The computing device of claim 1 wherein ~~an obscure~~ the portion of the second drawing surface is excluded from processing for rendering by the graphics driver.

30. (New) The computing device of claim 1 wherein the plurality of attributes of the graphic objects also includes a clipping region.